

## Explore spatial protein and subcellular gene expression profile with Stereo-seq for advancement in fundamental and translational research

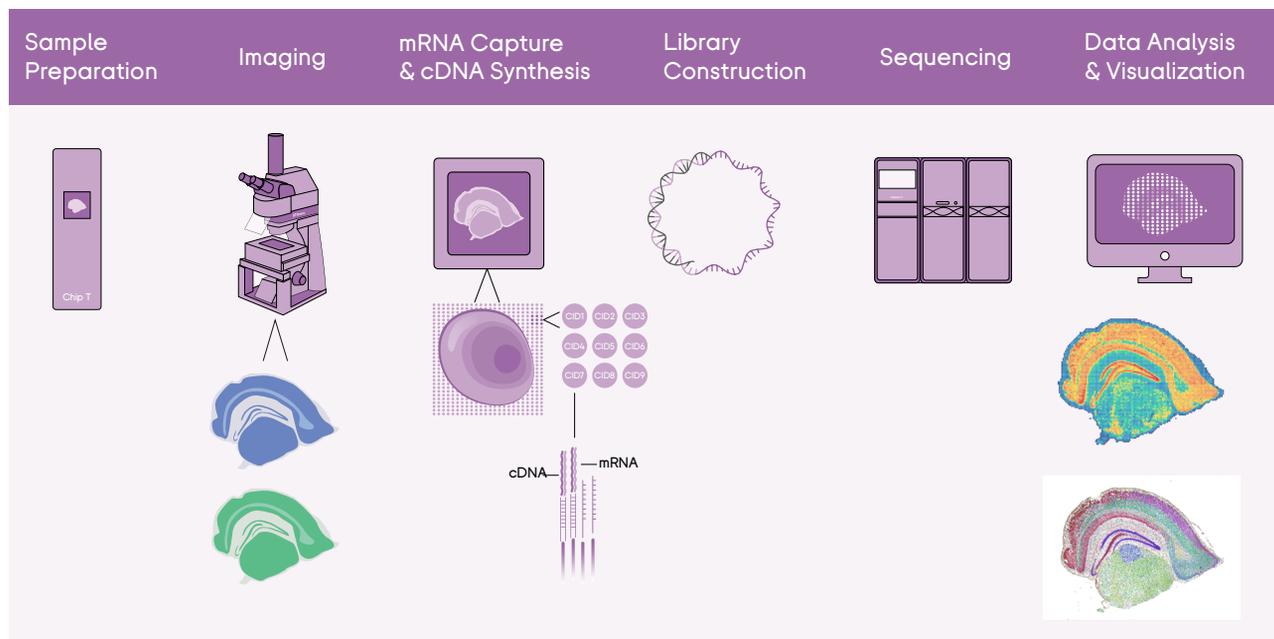
### 01 Stereo-seq Transcriptome and Multiplex Immunofluorescence (mIF) Co-detection

STOmics Stereo-seq Transcriptomics Set for Chip-on-a-slide is intended for generating a spatially-resolved 3' mRNA library from biological tissue sections. Built upon DNA Nanoball (DNB) technology, STOmics Stereo-seq Transcriptomics Set for Chip-on-a-slide enables a "tissue-to-data" solution through in situ capture of the whole transcriptome, at nanoscale resolution and centimeter-sized field of view. Stereo-seq Transcriptomics Solution utilizes DNB patterned array chips loaded with spatially-barcoded probes that capture and prime poly-adenylated mRNA from tissue sections in situ. Each cDNA synthesized from mRNA captured on a particular spot is linked to its spatially-barcoded probe, allowing subsequent gene expression mapping of a tissue section following sequencing and visualization analysis using the StereoMap visualization platform.

By integrating mIF staining method into the process of Stereo-seq Transcriptomics standard workflow, Stereo-seq transcriptome and multiplex immunofluorescence (mIF) co-detection technology enables spatial visualization of multiple proteins on top of the unbiased whole transcriptome information on the same tissue slice. Without affecting mRNA capturing, the additional detected protein information can be integrated with gene expression data to in-depth evaluate valuable samples, and to parse complex pathological and physiological processes. The amount of protein that can be detected depends on user's antibody selection and imaging configuration. In this user manual, we are showing DAPI with stainings of three antibodies as an example.

### 02 Application Highlights

- Study protein, unbiased high-resolution whole transcriptome information and tissue morphology on the same tissue section.
- Discover new tissue biomarkers and molecular targets at a spatial scale with cellular specificity.
- Interrogate gene expression profiles and protein markers in different tumor regions to further explore tumor progressing mechanisms.
- Characterize immune cells and immune repertoires within healthy tissue microenvironment vs TME.
- Identify the spatial location of secreted proteins within the cell under different conditions.



03 Gene Expression & Protein Cluster Demo Display

Mouse Testis

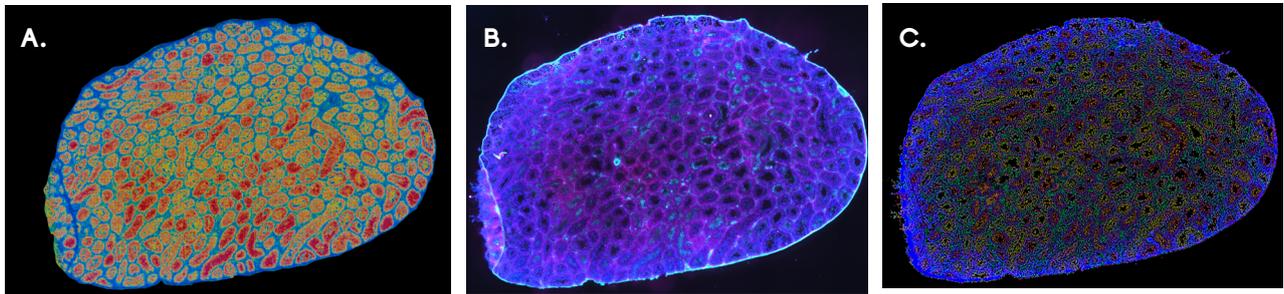


Figure 1. A. Spatial gene expression heatmap of mouse testis at bin20 (~10 μm). B. Merged immunofluorescence images of mouse testis stained for DAPI (nuclei staining), AKAP3 protein and TESK2 protein by immunofluorescence. C. Mouse testis single-cell clustering results using cellbinning and overlaid with merged immunofluorescence images.

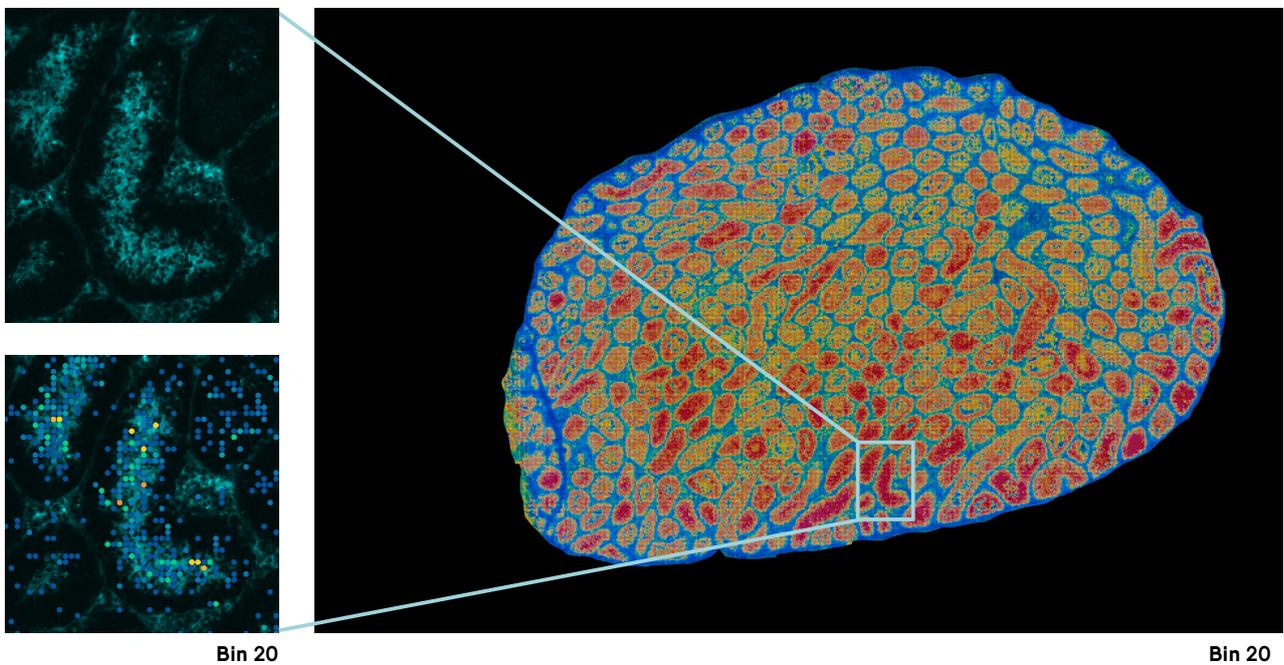
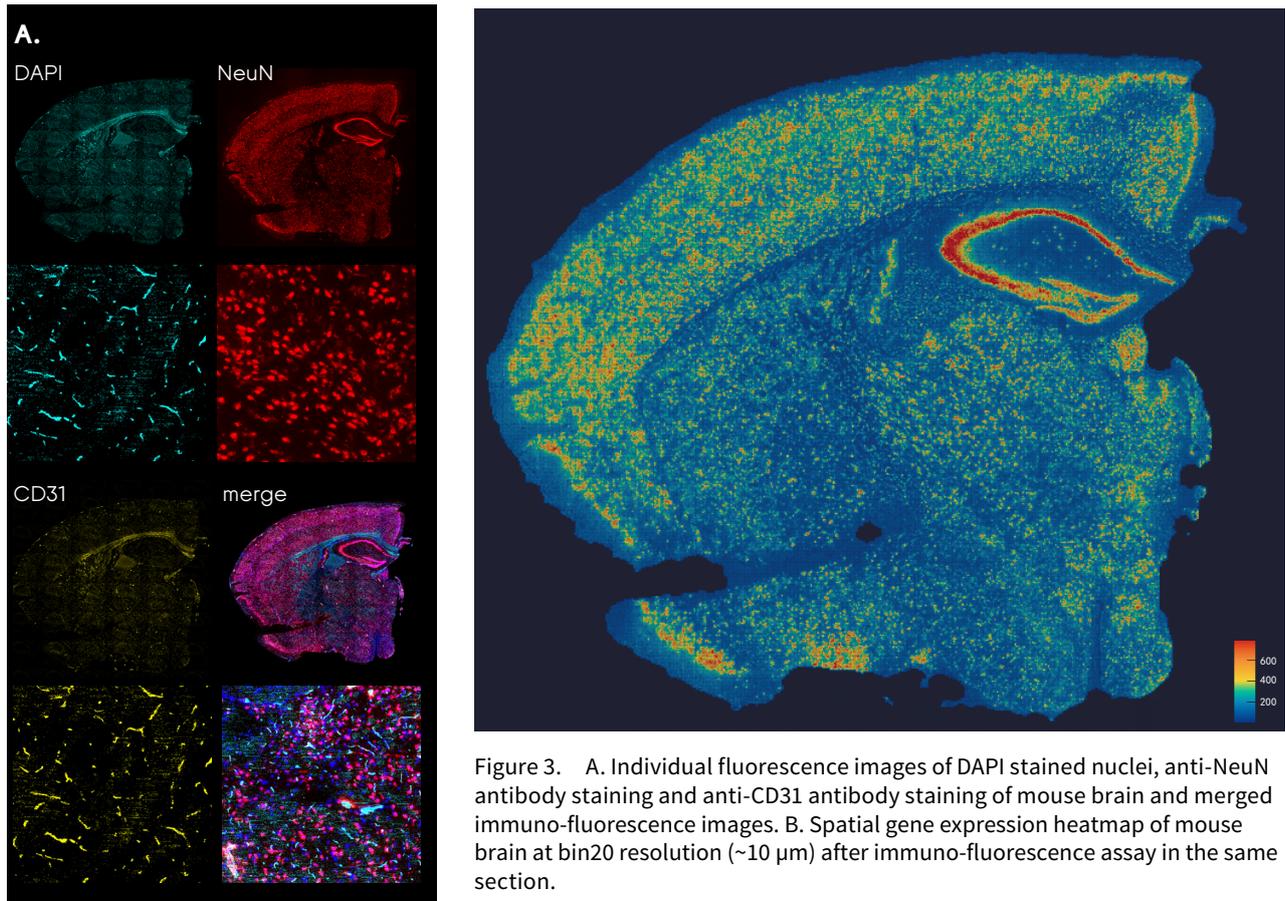


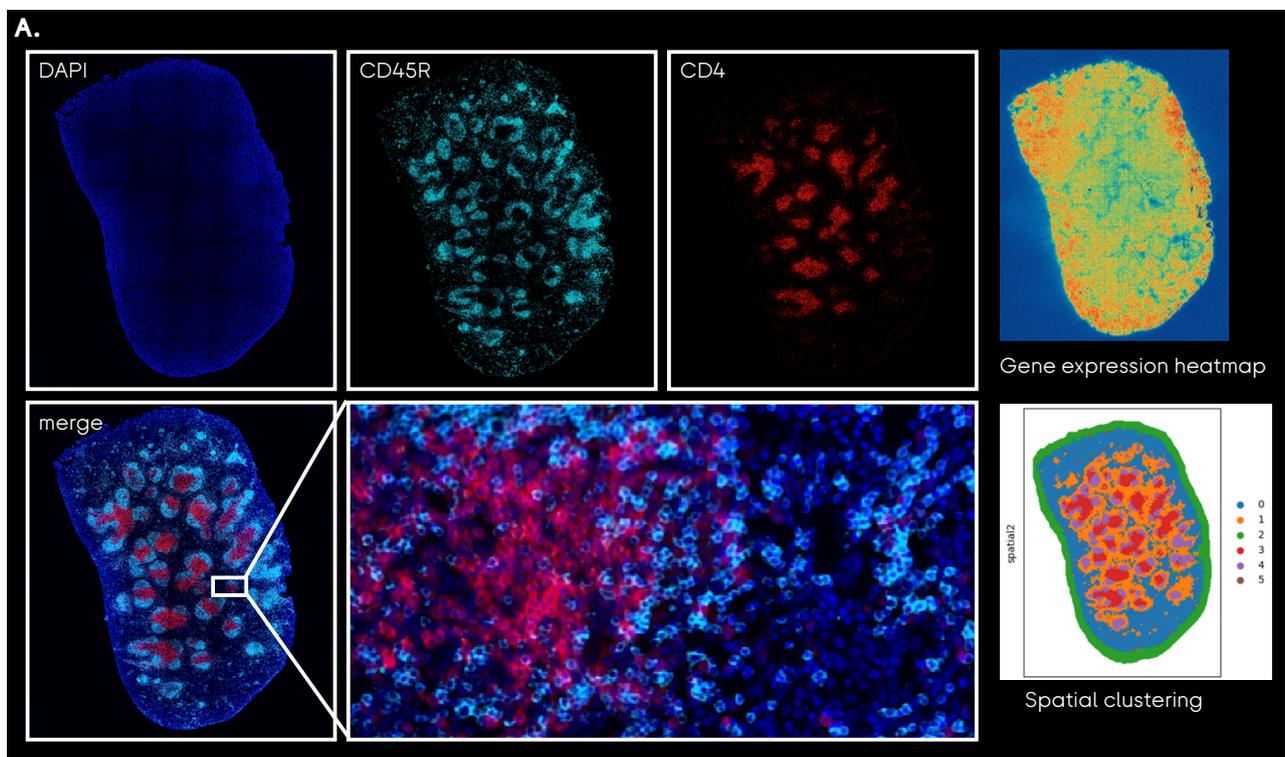
Figure 2. A mouse testis section was stained with anti-AKAP3 antibody and anti-TESK2 antibody and went through Stereo-seq Transcriptomics mIF workflow. Here, demonstrating a zoomed in region within the tissue with AKAP3 staining and co-localization of AKAP3 gene.

AKAP3 only  
 AKAP3 protein + AKAP3 gene

## Mouse Brain



## Mouse Spleen



## 04 Product Reagents

Perform Stereo-seq in your own laboratory with Stereo-seq Kits.

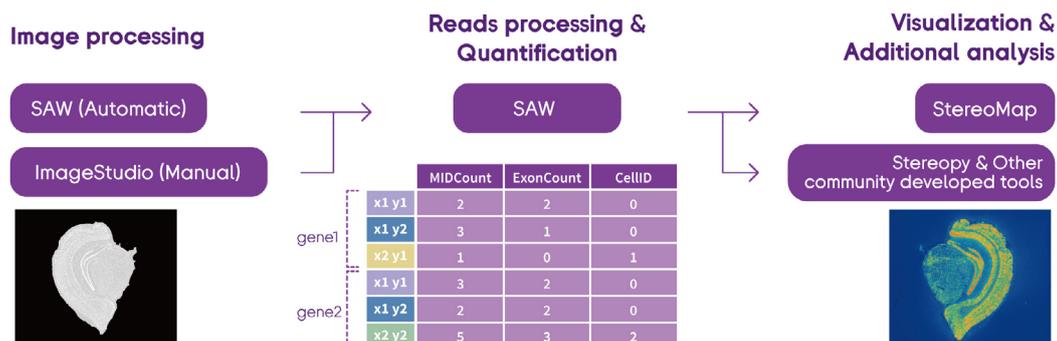
Stereo-seq Permeabilization Set for Chip-on-a-slide			
Part Number	Product	Specification	Description
211SP118	Stereo-seq Permeabilization Kit 111KP118	8 RXN	For determining permeabilization parameters to optimize mRNA capture
	Stereo-seq Chip P Slide (1cm*1cm) 210CP118	8 EA	
	STOmics Accessory Kit 1000033700	5 PCS	
Stereo-seq Transcriptomics Set for Chip-on-a-slide			
Part Number	Product	Specification	Description
211ST114	Stereo-seq Transcriptomics T Kit 111KT114	4 RXN	For generating a spatially-resolved 3' mRNA library from biological tissue sections
	Stereo-seq Chip T Slide (1cm*1cm) 210CT114	4 EA	
	STOmics Accessory Kit 1000033700	5 PCS	
Stereo-seq Library Preparation Kit			
Part Number	Product	Specification	Description
111KL114	Stereo-seq Library Preparation Kit	4 RXN	For constructing STOmics Library
Stereo-seq PCR Adaptor			
Part Number	Product	Specification	Description
301AUX001	Stereo-seq PCR Adaptor	2 EA	Compatible with PCR thermal cycler as a heating unit

## 05 Key Features

- 1 High fidelity protein staining imaging for enhanced spatial protein identification.
- 2 Chip-on-a-slide for efficient experiment operation and compatible with existing Stereo-seq solutions.
- 3 Detect multiple proteins with unbiased whole transcriptome simultaneously in fresh frozen and PFA fixed samples.
- 4 Flexibility in choosing antibodies based on user's research needs and project design.
- 5 Co-detection of protein and RNA in a single experiment for extensible applications in tissue and cellular type study.

## 06 Intuitive Software Pipelines and Suits

**ImageStudio** image processing software, **SAW** (Stereo-seq Analysis Workflow) and **StereoMap** visualization platform are offered free of charge to users and enables them to discover spatial biology knowledge with multiplexed tissue images.



Learn more: <https://en.stomics.tech/BioinfoTools>